DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Winter Examination – 2022

Course: B. Tech. **Branch : Civil Engineering** **Semester :V**

Subject Code & Name: BTCVC 501 Design of Steel Structures

Max Marks: 60 **Date:28/01/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*
5. *Use of **IS800, IS 875** and **steel table** is permitted*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		
A)	Explain Different types of Loads acting on steel Structure	Knowledge	**6**
B)	Determine the design strength of rivet in a butt joint by 2 plates 12 mm thick by using 8 mm thick cover plate with hand driven rivets for the case of single cover butt joint and double cover butt joint	Application	**6**
C)	Explain Different types of riveted joint	Remember	**6**
Q.2	**Solve Any Two of the following.**		
A)	A single angle ISA 90 x 60 x 8 mm is connected with longer leg to the gusset plate of 10 mm thick. Find the effective area a)with 18 mm diameter rivet b) welded connection	Application	**6**
B)	2 ISA 75 x 75 x 10 mm connected to gusset plate 12 mm thick with 16 mm diameter bolt find the permissible strength in axial tension connected same side of gusset plate take f_y = 250 Mpa	Application	**6**
C)	Calculate moment resisting capacity of a simply supported beam consist of ISMB 300 over a span of 3 m also calculate safe udl(excluding self weight) the beam can carry	Application	**6**
Q. 3	**Solve Any Two of the following.**		
A)	Calculate the Maximum wheel load and moments on Gantry girder for the following data crane capacity = 100 KN self wt. of crane 100 KN Self wt of trolley , motor and hook 20 KN Appx. min approach of crane = 12 m	Analysis	**6**

wheel base = 3.0 m

c/c distance between gantry rails = 14 m

span of GG 6 m

self wt of rail section 300 N/m

f_y 250 N/mm^2

B)	Calculate the section modulus and selection of section on Gantry girder for the same data as available on Q 3 A	Analysis	**6**
C)	Determine the live load per panel point for a Pratt truss of span 15 m with sloping angle 22^0take a weight of AC sheet roof covering = 175 N/m^2	Remember	**6**

Q.4 Solve Any Two of the following.

A)	Explain the Lacing system and battening system for columns	Knowledge	**6**
B)	Write short Note on Grillage Foundation	Synthesis	**6**
C)	Design a slab base for column section ISHB 300 @63.0 kg/m subjected to axial load of 900 KN M 20 concrete is used for foundation. Provide welded connection between column and base plate	Application	**6**

Q. 5 Solve Any Two of the following.

A)	Explain idealized stress strain curve for mild steel	Remember	**6**
B)	Explain the concept of plastic hinge	Knowledge	**6**
C)	Draw with neat sketch of different collapse mechanism	Synthesis	**6**

***** End *****